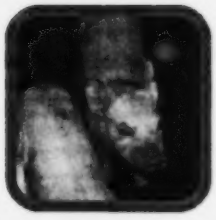
Ceptor Animal Health News

Volume 17, Issue No. 4, December 2009 – ISSN1488-8572

Serving Ontario through veterinary science, technology transfer, outbreak investigation and animal health surveillance



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Ministry of Agriculture, Food and Rural Affairs

Ontario

Happy Trails, Bob!!!

"Dr. Bob" has trotted off to other pastures

After 31 years as a devoted civil servant, Dr. Bob Wright retired from the Ontario Ministry of Agriculture, Food and Rural Affairs on October 30, 2009.

Bob began his career with the government in 1978, when, as a brand new graduate, he accepted the position of Lead Veterinarian in a government-owned, mixed-animal practice, North Cochrane Veterinary Clinic, in Kapuskasing. In 1986, Bob and his family moved to Guelph, where he began his new role as an equine extension veterinarian. Over the course of time, he added the alternate species portfolio, which included farmed cervids, rabbits, ratites, and mink.

During his career, Bob was a prolific author, preparing more than 150 factsheets and more than 500 snippets for his *Horse News and Views* columns. He also carried out research on alsike clover poisoning in horses; ergot alkaloid toxicity in pregnant mares; hay and mold evaluation in horse hay and Aleutian disease in farmed mink. Bob was instrumental in developing sampling protocols to test for chronic wasting disease (CWD) in cervids, a disease which, to date, has not been found in Ontario herds. He was a popular speaker at equine, cervid and rabbit information meetings in Canada and internationally.

In his retirement, Bob plans to spend time with his family and continue some of his research projects, in addition to running his small animal practice and catching up on his riding.

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Ceptor is published by: Veterinary Science and Policy Unit, OMAFRA
Editors: Ann Godkin and Janet Alsop
Graphics, layout and editing support provided by Client Services Branch
Website: www.ontario.ca/livestock
Archived issues of Ceptor: www.oabp.ca

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The Ontario Johne's Education and Management Assistance Program: A four-year program starting in 2010

Ann Godkin, Veterinary Science and Policy Unit, OMAFRA

What's in the program?

The program has four elements:

1. Education
2. Animal Health **R**isk **A**ssessment and **M**anagement **P**lan (**RAMP**),
3. Johne's testing and
4. Removal of high-titre Johne's cows.

The program offers each producer a financial incentive to test all lactating cows once during the four years of the program. Producers will be required to do the RAMP with their trained herd veterinarian each year and remove high-titre cows within 90 days of test day.

What's an Animal Health Risk Assessment and Management Plan (RAMP)?

The "Animal Health RAMP" is now an annual requirement on each Dairy Farmers of Ontario (DFO)-licensed farm. The Animal Health RAMP guides the veterinarian and the producer step by step through calf raising and general sanitation practices. After doing the questionnaire, the producer and the veterinarian decide what will be done in the next year. This is the "management plan". It will be up to the veterinarian and producer to decide what is best for the herd and the situation, and for the producer to implement the recommendations. Producers are asked to contact their own veterinarian directly to schedule the RAMP. Once the RAMP is completed, the veterinarian will submit the RAMP summary page to the Johne's program co-ordinator.

How will the testing work?

Each producer will be allotted a six-week testing window. The list of testing dates is published in the Milk Producer in December 2009 and on the Johne's program website (*www.johnes.ca*). A producer will receive a Testing Submission Form (their "green sheet") with their DFO monthly statement prior to their allotted testing time. Once the green sheet is received, a producer can choose to test either by:

- letting their CanWest DHI staff know (or contacting DHI directly if not on their regular service) to have their test-day samples tested at that time for Johne's at DHI (using the milk ELISA) or
- contacting their veterinarian to set up blood sampling and testing at the Animal Health Laboratory in Guelph (using the serum ELISA).

The "green sheet" is to be sent to the laboratory with the samples to be tested, to indicate they are part of the Johne's program.

How does a producer get reimbursed for testing on the program?

A producer who tests all lactating animals in the herd on test day during his/her testing window is eligible to receive an eight dollar per test reimbursement provided all conditions below are met.

- All testing costs need to be paid by the producer (up front, if not a regular DHI customer).
- Any cows found to have positive tests in the very high range (**1.0 or higher on the milk ELISA** or equivalent value on the serum ELISA) must be removed from the herd (and verified), not to another herd or the food chain, within 90 days of the testing date; and
- The RAMP for that year must be conducted prior to reimbursement.

Once the program co-ordinator knows all program requirements have been met, a cheque for the testing reimbursement will be sent to the producer.

How does a producer prove (verify) that any high-titre cows have been removed?

If a high-titre cow is found in a herd, and the owner chooses to remove her, she can go to on-farm disposal (burying or composting) or to rendering. If she goes to rendering, the collector can sign the "Animal Disposal Form" to confirm the pickup. If the animal is disposed of on-farm, the owner completes the "Animal Disposal Form" and the herd veterinarian signs to confirm removal. There is no time limitation on the sign off. This step can be completed at a regular herd health visit.

(Continued on page 4)

Who is running the program?

This is an industry-lead program, administered with the assistance of the University of Guelph. The Johne's Program co-ordinator is Nicole Perkins. Information and forms are posted on the Johne's Program website at *www.johnes.ca*

Johne's Education and Management Assistance Program For Ontario Dairy Producers

Why should a veterinarian participate?

This is an opportunity for veterinary practitioners to:

- Work proactively to prevent Johne's Disease spread. Strengthen your role in the milk production chain.
- Expand your herd-health program to include calf, heifer and cow assessments and initiate an ongoing program through annual re-evaluation.
- Help your clients to have better herd health. The benefits in improved calf health for many producers will be more extensive and immediate than the prevention of Johne's infections.
- Assist herd owners that you know have been struggling with Johne's Disease, yet haven't had the means or incentives to make progress.

Veterinary Activities in the program:

1. Interpret test results if testing is being done. Each herd has the opportunity to test once during the 4-year program. Testing is voluntary. You need to "sell" it if you want to see it!
2. Conduct the RAMP with the client once annually. Bill producers directly as you would for routine herd-health consultations. It is typical for an initial RAMP to take one hour, but this will depend on the issues encountered. Subsequent annual reviews may take less time.
3. Make written recommendations for changes on the farm via the RAMP document.
4. Sign disposal forms for cows with titres 1.0 or higher once they are disposed of, if done on-farm by the producer through burial or composting. (Deadstock collectors will verify the removal of cows they pick up.)
5. Fax the completed RAMP form to the Johne's Project Co-ordinator.

What does a veterinarian need to do?

- Help your clients understand the program and complete the program requirements.
- Encourage your clients to take advantage of the financial support for testing the herd once.
- Become a trained veterinarian able to complete and sign-off on the Ontario Animal Health and Johne's RAMPs. The RAMP is slightly different than the previous version, but comes with a manual to help you conduct these consistently.

If you **completed a training risk assessment** as part of the previous Johne's programs (2005 to 2007), then you are already trained. You should review the messages the current program seeks to deliver.

If you are a **recent OVC graduate**, and participated in a Johne's risk assessment as part of the 4th year Dairy Elective, you are already trained.

If you have not previously participated in either of these two **Johne's training opportunities**, contact Ann Godkin or Jocelyn Jansen (OMAFRA) to book a training session. These will be set up beginning in January as required.

If you are unsure of your status, contact Nicole.

For more information contact:

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Guidelines for Johne's Disease Test Utilization and Interpretation for Ontario Veterinarians

Ulrike Sorge, Population Medicine, Ontario Veterinary College, Jocelyn Jansen and Ann Godkin, Veterinary Science and Policy Unit, OMAFRA

The causative agent of Johne's Disease in cattle is *Mycobacterium avium* subspecies *paratuberculosis* (MAP). As part of the Ontario Johne's Disease Education and Management Assistance Program, producers have the opportunity to be reimbursed for one herd test for MAP antibody. Veterinary practitioners will be called upon to interpret results and help producers plan for future testing. Using standard interpretation criteria will help us all to relay consistent information to producers and reduce confusion and inertia.

Test interpretation – A Key Message of the Ontario Program:

A key message of the Ontario program is to interpret the MAP herd-test results at the herd level to achieve maximum benefit with minimum error. You can test your understanding of this with a "test question". If a result is truly being interpreted at the herd level, you would not need to know which cows had which results; you would only need to know how many head were tested and how many had strong positive, positive, suspicious or negative test results. Having said that, individual cow results are reported by both CanWest DHI and the Animal Health Laboratory, and do help us in some ways, but should not be "over interpreted". Cow results can help veterinarians detect disease patterns in a herd (Are the positives purchased or home raised cows?), trends over time, make management recommendations and, under very special circumstances, to make individual cow decisions. It is very important that veterinary practitioners help producers to make the correct interpretation of their test results and to use the information to improve their calf-health program.

The Individual Cow Level

Using ELISA at the cow level:

- The sensitivity and specificity of the milk and serum ELISA tests for MAP antibody are similar (Lombard *et al.*, 2006)
- Both tests have poor sensitivity in detecting infected individual animals. There will be false-negative test results.
- Specificity of both tests is high but not 100%. There can be a small number of false-positive test results (See **Table 1**).
- Antibody titres in milk and serum may fluctuate over time and this can lead to changes in cow test results (van Schaik *et al.*, 2003)
- Milk ELISA is slightly more sensitive at the cow level at the beginning and end of lactation (Nielsen *et al.*, 2002a & 2002b).
- Serum ELISA may be slightly less sensitive at the end of the dry period or early lactation (3 weeks prior to, as well as 3 weeks after, calving) (Stabel *et al.*, 2004).

Table 1. "Assumptions for test sensitivity and specificity used when selecting the best test for detection of paratuberculosis in cattle" (Collins *et al.*, 2005)

Test (for individual cows)*	Sensitivity (%)	Specificity (%)
Bacterial Culture of fecal samples	60 ± 5	99.9 ± 0.1
PCR assay of fecal samples	30 ± 5	99.5 ± 0.5
ELISA on serum or milk	30 ± 5	99.0 ± 1.0
Evaluation of biopsy specimens	90.5 ± 5	100
Necropsy	100	100

* The test Sensitivity and Specificity are averaged numbers from the literature.

(Continued on page 6)

ELISA interpretation at the cow level:

- Individual test-result scores of 1.0 or greater on the milk ELISA or the equivalent on the serum ELISA are **strong positives.**
- The higher the antibody titre (or optical density), the more likely it is that the cows are truly positive and the less likely they are to change their test-result status (Sorge *et al.*, Ontario research 2009, unpubl.).
- Research suggests that animals with scores of 1.0 or greater likely have MAP disseminated throughout the body, are actively shedding MAP and are more likely to become clinical in the current or next lactation.
- The significance of the variation in ELISA sensitivity associated with testing at different stages of lactation is small compared to the overall low sensitivity of the test for accurately predicting the infection status of each individual cow, especially those in the early stages of infection or disease.
- **It is not possible to use Johne's tests of individual cows to determine cow status prior to purchase or introduction.**

Take-home messages at the cow level:

#1: Interpret all Johne's tests with caution at the individual cow level. Only when test results are very high, can the individual cow's status be known with any reasonable level of confidence.

#2: Interpret all test results using all available information. Use knowledge of the history of MAP in the herd, the age and the breed of the cattle tested, where the animals were raised and the likelihood of MAP introduction through frequent animal additions from other herds.

#3: WAIT and retest, to gain confidence in a particular cow's status. Repeated testing (multiples) with the same test over time (months to years) gives greater confidence than using different types of tests at the same time.

The Herd Level

Using ELISA at the herd level:

- Test the full herd at least once initially. Test all cows in the milking herd, including first lactation animals, on a single occasion. Ensure that dry cows are not overlooked.
- The sensitivity of aggregates of individual cow ELISA tests to identify a herd as being positive for MAP infection is high (based on a herd being classified as positive when they have two or more test-positive animals)(Hendrick *et al.*, 2005, Tavornpanich S *et al.*).

ELISA interpretation at the herd level:

- **Interpret the herd test results at the herd level to answer two questions:**
  1. Is it likely that the herd has Johne's Disease? (If at least one cow had a positive test, the answer is yes.)
  2. If yes, is MAP infection likely to be a big or small problem for this herd owner?
     - 0% *is considered* a test-negative herd.
     - 1- 5% *is considered* a low test-positive herd.
     - 6-10% *is considered* a moderate test-positive herd.
     - >11% *is considered* a high test-positive herd.
- Culling all test-positive cows alone does not make a herd MAP-infection negative. Undetected (test-negative) subclinical MAP shedders can still be present in the herd and transmit infection to calves. This would be an inappropriate use of Johne's test results.

Take-home messages at the herd level:

#1: Testing of all cows in the herd for Johne's at one time gives the best description of herd status. Repeated testing over years gives greater confidence in the herd status.

#2: Use the herd test result to answer two questions at the herd level – Is it likely this herd has Johne's? If yes, how big a problem is it?

#3: The best prevention for Johne's Disease is to make changes to management at the herd level. The combination of removing Johne's strong test-positive cows and making the appropriate herd-level management changes are the most effective means of reducing the prevalence of Johne's.

(Continued on page 7)

How often should a herd be tested for MAP?

Currently there are no formal requirements for how often a herd is to be tested for certification or other reasons, so the answer is "it depends". Factors to consider are: the frequency of positive tests in the last herd test, the age distribution of the cows in the herd, the Johne's goal of the herd owner and the expected cost-benefit.

For example:

a) A herd has no history of clinical Johne's disease, introduces no cattle and was completely test-negative at the last herd test. It would be appropriate for the testing interval to be multiple years. It is a low-risk herd.

b) A herd had 15% of cows test positive at the last Johne's herd test. Repeated testing with a short interval between tests (up to 3-4 times per year) would be appropriate. There is need to identify infected animals quickly (as soon as possible after they advance to test-positive status) to rapidly reduce the reservoir of MAP on the farm, to reduce infection pressure on calves and to reduce the risk of having test-positive cows advancing to clinical Johne's Disease.

Ultimately, the testing plan has to be tailored to each herd. The herd veterinarian and the owner need to work together to make the best management and testing plan for each herd's situation.

Take-home message about herd programs:

#1: The frequency of herd testing depends on the herd's disease and management situation.

Collins et al. Consensus recommendation on diagnostic testing for the detection of paratuberculosis in cattle in the United States. JAVMA 2006; 229:1912-1919.

Godkin MA. Mycobacterium avium paratuberculosis (MAP): Single tests can fool you. Ceptor Animal Health Newsletter, February 2009. www.oabp.ca

Hendrick et al. The prevalence of milk and serum antibodies to Mycobacterium avium subsp. paratuberculosis in dairy herds in Ontario. Can Vet J 2005; 46:1126-1129.

Lombard et al. Comparison of milk and serum enzyme-linked immunosorbent assays for diagnosis of Mycobacterium avium subspecies paratuberculosis infection in dairy cattle. J Vet Diagn Invest 2006; Sep,18(5):448-458.

Nielsen et al. The Mycobacterium avium subsp. paratuberculosis ELISA response by parity and stage of lactation. Prev Vet Med 2002a; 54:1-10.

Nielsen et al. Variation in the Milk Antibody Response to Paratuberculosis in Naturally Infected Dairy Cows. J Dairy Sci 2002b; 85:2795-2802.

Stabel et al. Efficacy of immunologic assays for the detection of Johne's disease in dairy cows fed additional energy during the periparturient period. J Vet Diagn Invest 2004; 16:412-420.

Tavornpanich S et al. Simulation model for evaluation of testing strategies for detection of paratuberculosis in midwestern US dairy herds. Prev Vet Med 2008; Jan 1,83 (1):65-82.

Van Schaik et al. Longitudinal study to investigate variation in results of repeated ELISA and culture of fecal samples for Mycobacterium avium subsp. paratuberculosis in commercial dairy herds. AJVR 2003; 64:479-484.

Improving the Dairy Industry's Position on Animal Welfare

Submitted by Ann Godkin, Veterinary Science and Policy Unit, OMAFRA

During a dairy symposium held in California in October 2009, invited speaker Dr. Bernard Rollin, University of Colorado, made some comments that were thought provoking. He was asked to help producers and industry advisors to understand how the issue of animal rights has become a mainstream phenomenon.

To improve the dairy industry's position on animal-welfare, Rollin told the attendees:

1. Get rid of the Happy Cow Commercials and tell the truth. "Don't hang your future on a lie."
2. Be in charge of your own future. "Don't wait to be told by the government – which doesn't know what it's talking about."
3. Look at the social ethical landscape. "Find the problems and fix them before it's too late."
4. Pay attention to the longevity of cows. "It's an iconic image that a cow lasts a long time."
5. The industry needs more "cow-smart" people that focus on animal husbandry.
6. "Laws don't mean anything. The industry needs to police itself."
7. "Examine the treatment of bull calves and fix areas of concern."
8. Feed calves for weather conditions. "This is an animal-welfare issue. Calves need to have enough fat reservoirs to survive the cold."

Displacements at a Feed Bunk with Two Variations of a Feedstall

Neil Anderson, Veterinary Science and Policy Unit, OMAFRA,
Sherry Deemar, Veterinary Consultant, Stayner, Ontario, and
Paisley Canning, Animal Health Laboratory, University of Guelph, Guelph, Ontario

Feedstalls are loops separating feeding places at a feed bunk. Their purpose is to decrease the frequency of aggressive behaviours or displacements at the bunk. There is scant research about designs for feedstalls. Therefore, we welcomed an opportunity provided by Kevin Kraemer (Advanced Dairy Systems, Wellesley, ON) and Henry and Kevin Wydeven (Avonbank Holsteins, St. Mary's, ON) to observe displacements by cows using two styles of feedstalls. The feedstalls under evaluation were similar in design except one version had a vertical pipe installed at the bunk or mounting-end (**Figure 1**). Our objective was to quantify the frequency of displacements and to determine whether the vertical bar was a useful addition to the loop design.

Feedstall installation was in a 24-stall pen with 18 mature and 6 first-lactation Holsteins. An existing 46-inch-high post-and-rail barrier was secured at 10-foot intervals by C-channel imbedded into a 20-inch-high manger curb. The feedstall loop was attached on 30-inch centres to the barrier rail and a horizontal pipe at the manger curb.

Figure 1. Feedstalls mounted at a post-and-rail barrier. A white arrow points to the vertical pipe mentioned in the text.

Four cameras recorded activities in four 10-foot bunk sections between 5:00 a.m. and 11:00 p.m. each day for four days. Bunk sections 1 and 2 each had four feedstalls with the vertical pipe. Sections 3 and 4 each had feedstalls lacking the vertical pipe. Displacements were defined as an aggression (a head butt or a push) by an actor cow that resulted in the complete withdrawal of the head over the manger curb of a reactor cow. (**Figure 2**) Actor cows made contact at the front (head and neck – 91.3%), the side (area between the withers and hips – 5.9%), or the rear (area caudal from the hips – 2.8%) of reactor cows.

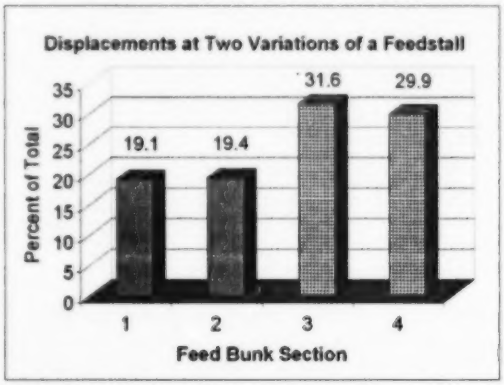

Figure 2. Displacements at feedstalls with (1 and 2) and without (3 and 4) a vertical pipe in the design. (n=288)

There were a total of three displacements per cow per day, with 1.2 occurring in sections 1 and 2 of the bunk, and 1.8 in sections 3 and 4. The frequency of displacements was similar between bunk sections 1 and 2 (19.1 and 19.4%) and between bunk sections 3 and 4 (31.6 and 29.9%). Displacements were 1.6 times more frequent in feedstalls without the vertical pipe. Since 91.3% of aggressive contacts happened at the head, future studies should investigate loop designs mounted over the feed manger.

Lying Left and Right and Standing in Three Tie-stall Dairy Barns

Neil Anderson, Veterinary Science and Policy Unit, OMAFRA, and
Paisley Canning, Animal Health Laboratory, University of Guelph, Guelph, Ontario

Rick recently passed along a question from a client who wanted to minimize potential injury or discomfort from leg-mounted transponders by choosing to use whichever leg would be opposite to the most frequent resting side. Rick believed cows showed no preference, and, for practical reasons, told the client to pick one side and use it for all cows.

Our first-hand information comes from data collected recently using Hobo Pendent G Data Loggers (Onset Computer Corporation, Pocasset, MA) mounted on the legs of 18, 19 and 20 tie-stall cows for 8, 8, and 7 days respectively in three barns with similar stall dimensions but different beds. The pooled data revealed 2,623 lying left, 2,627 lying right and 4,996 standing bouts. Daily averages were 6.0±2.0 (mean±SE), 6.0±3.0 and 11.5±3.4 respectively (**Figure 1**). These data showed there were equal bouts per day for left- and right-side lying. Based on bouts of lying, Rick gave sound advice.

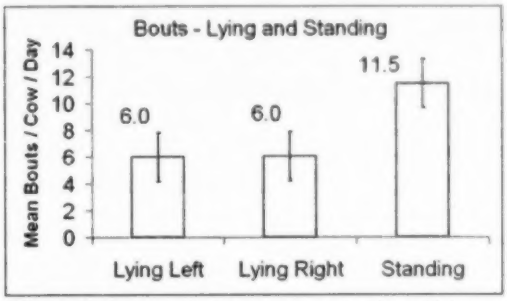

Figure 1. Average bouts per cow per day of lying and standing.

The average duration of bouts, in minutes, was 64.1±0.96 for lying left, 60.4±0.92 for lying right and 60.3±1.02 for standing (**Figure 2**). The average lying-left time was 3.7 minutes greater than the average lying-right time (T=2.8, p=0.006, 95%CI for the difference is 1.1 to 6.3). By extrapolation, on each day the study cows rested about 22 minutes longer on their left side than their right. That's about 134 hours more annually.

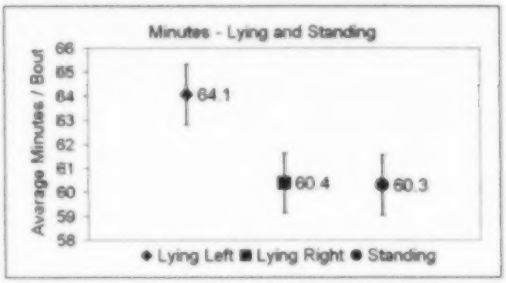

Figure 2. Average minutes/bout for lying left, lying right and standing.

Our findings for bouts of lying left and lying right are similar to those in other studies. Forsberg *et al.* found equal bouts of left and right lying for Swedish Red and White cows in a free-stall barn with an automated milking system. Tucker found free-stall housed or pastured Canadian Holstein lactating cows showed no preference for one side over the other.

We found lying-left bouts were longer in duration than lying-right bouts. The significance to the cow of 22 minutes per day without bearing weight on a left-leg-mounted transponder is unknown. A producer who considers the time significant for his cows may choose to put transponders on the right leg. Most importantly, Rick's client was looking out for the welfare of his cows. We like the way he thinks.

Forsberg AM, Pettersson G , Ljungberg T, Svennersten-Sjaunja K . A brief note about cow lying behaviour—Do cows choose left and right lying side equally? Applied Animal Behaviour Science 2008; (Nov), 114 (1-2):32-36.

Tucker CB, Cox NR, Wearry DM, Spinka M. Laterality of lying behaviour in dairy cattle. Applied Animal Behaviour Science 2009; (Sept), 120 (3-4): 125-131.

What Do High Profit Dairies Look Like?

Bill Grexton, CanWest DHI, Guelph, Ontario

Profit Profiler Dairy Financial Analysis service allows herds to be financially compared in many ways. One way to measure profitability is to measure how much money is left after all the bills are paid. For example, in the comparison below (Tables 1 and 2), the herds were divided into high- and low-profit groups based on the Percent Profit after all costs were paid. Although this comparison reduces the importance of herd size, the more profitable herds had considerably more cows.

How much difference was there? To start with, the High-Profit group paid only $.702 to make each dollar while the Low-Profit group paid $.909. The extra $.20 per dollar earned was available to go to manager profit, as labour was already included in the cost, and principal repayment.

In terms of total profit earned, the high-profit group made a net profit of $514,300 compared to only $98,700 in the low-profit group. When both were standardized to a 100-cow herd, the high-profit group earned $238,100 compared to $66,700 earned by the low-profit group, or more than three and one-half times more profit.

What were some of the differences? The high-profit group sold more milk per cow and per man (**Table 1**) and grossed $522 more per cow from milk and livestock sales. They spent less for labour (12.3% compared to 15.2% of gross revenue) and less on replacement costs. Total milk cow costs were $33.32 per hectolitre, which was about $9.50 less than the low-profit group.

High-profit herds carried about 10% less debt and had more than adequate profits to cover the principal owed. The low-profit herds, in many cases, did not generate enough profit to cover principal.

Table 2 shows some other comparative measures. It appears that reproductive performance and forage mix had little effect on profit differences. Crop yield reduced the home-grown feed cost per cow as evidenced by the fewer number of acres and lower forage costs per cow in the higher profit group. First-lactation cows gave more milk and labour efficiency was better. The bottom line was that the additional milk sold per cow increased revenue per person.

Table 1. Comparing High- and Low-Profit Dairies

	High Profit	Low Profit
Cost to make $1.00 of Revenue	$.702	$.909
Milk Cow Total Feed Cost (as % of milk revenue)	22.0%	25.7%
Milk Cow Labour Cost (as % of Milk revenue)	6.3%	8.9%
Health & Breeding Cost (as % of Milk revenue)	3.1%	3.7%
Total Cow Cost (as % of milk revenue)	47.9%	57.2%
Total Replacement Cost (as % of milk revenue)	10.0%	13.0%
Cost per Heifer per year	$ 823	$1,045
Milk Sold per Cow per yr	9,794	8,999
Milk Revenue per Person	$500,200	$298,900

Take-home message: All herd sizes can achieve higher profit. Knowing which cost to focus on requires an evaluation of a financial analysis such as is provided by the Profit Profiler.

Profit Profiler Dairy Financial Analysis Service is available to all producers, including those not on a DHI testing program. All information is kept strictly confidential. For more information, contact Bill Grexton (800) 549-4373 ext. 254 or see *www.canwestdhi.com/profiler.htm*.

Table 2. Comparing High and Low Profit Dairies (cont'd)

Area	Measure	High Profit	Low Profit
Reproduction	Pregnancy Rate	17.8	17.1
Cropping	% Corn Silage	29%	31%
	Forage Cost per Acre	$427	$405
	Forage Acres per Cow	1.5	1.9
	Forage Cost per Cow	$637	$735
Heifer Program	Lact 1 prodn: Herd Avg	90.4%	83.1%
Labour	Kg Fat sold per person	27,165	15,900

Monitoring for PRRS Virus in a Sow Herd

Tim Blackwell, Veterinary Science and Policy Unit, OMAFRA

Practitioners are becoming increasingly proficient at eliminating Porcine Reproductive and Respiratory Syndrome virus (PRRSv) from swine farms. One component of a PRRS elimination strategy often involves using PRRSv naïve animals as sentinels after a virus elimination process has been completed. These animals are placed in contact with the animals that have gone through the PRRS elimination procedure to see if they subsequently test positive for PRRSv. Sentinel swine are generally left in contact with the suspect animals for two to four weeks, or longer, before being tested for either antibodies or virus, or both. This procedure has been relied on as an effective means of testing for virus circulation in swine after an outbreak.

There appears to be one situation where sentinel animals may not be effective in identifying PRRSv in a herd following an outbreak. This situation occurs in gestating sows that have recovered from a PRRS outbreak. Mature sows are efficient at resolving and eliminating PRRSv infection. However, if, during infection of the sow, the virus manages to enter the pregnant uterus, infection can persist and remain viable in the developing feti. Virus can be present within the sow even after all signs of infection in the sow herself have resolved. The PRRSv can likely remain viable because the fetal immune system is not as efficient as the sow's in eliminating the virus. Virus that may "leak" back into the sow from an infected fetus is quickly destroyed. As a result, sentinel animals placed into a sow barn may not be exposed to the virus, as it exists only in the fetal environment. In this situation, testing of sentinel animals for PRRSv may falsely indicate that virus has been eliminated from the herd. Practitioners should be cautious when declaring a sow herd virus negative based on testing of the sows themselves or from the test results of sentinel pigs in contact with those sows.

The Use of Thoracic Fluid in Swine Diagnostic Testing

Tim Blackwell, Veterinary Science and Policy Unit, OMAFRA

Thoracic fluid generally has limited usefulness in laboratory testing but, occasionally, can be practical for certain PRRSv diagnostic situations. It is seldom of more value than a blood sample. However, thoracic fluid has many characteristics similar to serum, especially in the case of exudates, and can be much simpler to collect.

Although blood testing of suckling pigs is the preferred method of monitoring for PRRSv in a farrowing barn, bleeding a representative sample of newborn pigs can be a challenging undertaking. After a Porcine Reproductive and Respiratory Syndrome virus (PRRSv) outbreak, testing of thoracic fluid may be of benefit in a sow herd presumed to be virus free. In dead newborn piglets it is easy to open the chest with a scalpel blade and expose the thoracic cavity, where generally there is from one to three mLs of fluid present. Collecting thoracic fluid from all stillborns, mummified fetuses, or pigs that die in the first 48 hours after birth is an easy method to increase sample size when testing litters for PRRSv by blood testing. In some circumstances sampling thoracic fluid from these mortalities may increase the chances of identifying PRRSv, since litters with stillborns, mummified fetuses, or increased early pig deaths may be at higher risk for intra-uterine PRRSv infection.

Thoracic fluid samples can be collected and stored in the same manner as sera and used for pathogen identification or the presence of antibodies. Fetal swine are not immunocompetent until 70 days of gestation, so antibody production in pigs infected before 70 days of gestation will likely not occur. It is also possible for a pregnant sow to abort her litter due to clinical PRRSv without the virus infecting the litter itself. In such cases it is likely that the sow aborts due to the high fever and malaise associated with the infection and not due to death or disease in the litter.

Following a PRRS outbreak, in cases where owners decide to abort litters rather than have weak and viremic pigs born over a period of several weeks, testing of fetal thoracic fluid by PCR for PRRSv can help predict when virus-positive pigs are no longer being produced. The testing of thoracic fluid is another tool to use to help with effective PRRS monitoring in certain situations.

Prevalence of Methicillin-Resistant *Staphylococcus aureus* (MRSA) in Breeding Pigs in the European Union

Janet Alsop, Veterinary Science and Policy Unit, OMAFRA

MRSA is an important human pathogen. There are two main categories of infection: hospital-associated MRSA (HA-MRSA) and community-associated MRSA (CA-MRSA). Generally, the CA-MRSA strains, such as USA300 and USA400, are more treatable than the HA-MRSA strains because they exhibit less antimicrobial resistance. However, they are more virulent, and infection may result in severe tissue necrosis or toxic shock syndrome. As HA-MRSA strains spread into the community and CA-MRSA strains are carried into health care facilities, it is possible that the general population will become infected with MRSA strains in both categories, resulting in increased treatment challenges.

An increasing number of studies from several countries, including Canada, have demonstrated the presence of MRSA in several animal species, including livestock, pets and wild animals. There is currently no evidence of foodborne transmission of MRSA.

In 2005, researchers in the Netherlands identified MRSA in pigs and transmission of MRSA to pig farmers. It is not known why colonization with MRSA is common in pigs. A variety of strains have been isolated from both pigs and pig workers. The majority are classified as sequence type (ST) 398, a newly-emerging strain. In most cases, colonization with MRSA ST398 in humans is non-clinical. One hospital in the Netherlands reported an outbreak of MRSA ST398 in patients. However, it seems that patient-to-patient transmission of livestock-origin MRSA ST398 is lower than transmission of HA-MRSA strains.

To assess the prevalence of MRSA in pigs in the European Union (EU), a large survey was carried out. Sampling took place between January 2008 and December 2008 in 24 EU member states and two non-EU member states. A total of 4,597 farms with breeding swine were tested. The target population was farms whose total populations accounted for at least 80% of the breeding pig population per member state.

When the survey was planned, it was found that taking five dust samples per farm was only marginally less sensitive than collecting 60 nasal swabs and was considerably easier and less expensive. The samples were taken in the immediate environment of breeding pigs (boars and sows >6 months old) on each farm, pooled and tested for MRSA. All isolates were typed.

Seventeen of the twenty-four member states and one of the two non-member states had MRSA detected on their farms. MRSA ST398 was the predominant MRSA lineage identified, accounting for 92.5% of the MRSA isolates. Swine tested in Spain, Germany, Italy and Belgium had the highest prevalence (>30%) of all MRSA types, as well as MRSA ST398 in particular.

The EU plans to carry out additional surveys in growing pigs, poultry and cattle, and to investigate the human health significance of the MRSA non-ST398 strains found in pigs.

These findings are similar to recent work carried out in Ontario by Khanna *et al.* and confirm that MRSA and MRSA ST398 are common in both swine and swine workers in pig-producing countries. In the Ontario study, USA100, a HA-MRSA strain, was identified in 14% of the pig isolates, suggesting that human-to-pig transmission was also occurring.

The results of the EU survey highlight the need for collaboration between the veterinary and human medical professions to improve communication regarding the roles of both animals and humans in MRSA transmission.

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Bassetti M, Nicco E, Mikulska M. Why is community-associated MRSA spreading across the world and how will it change clinical practice? Int J Antimicrob Agents 2009;34 Suppl 1:S15-19.

(Continued on page 13)

European Food Safety Authority. Analysis of the baseline survey on the prevalence of methicillin-resistant Staphylococcus aureus (MRSA) in holdings with breeding pigs, in the EU, 2008 [1] - Part A: MRSA prevalence estimates. www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1211903070127.htm

Khanna T, Friendship R, Dewey C, Weese JS. Methicillin resistant Staphylococcus aureus colonization in pigs and pig farmers. Vet Microbiol 2008 Apr 30; 128(3-4):298-303.

Wulf MWH, Markestein A, van der Linden FT, Voss A, Klaassen C, Verduin CM. First outbreak of methicillin-resistant Staphylococcus aureus ST398 in a Dutch hospital, June 2007.

Anthelmintic Use in Small Ruminants—Interpretation of the National Organic Standards

Jocelyn Jansen, Veterinary Science and Policy Unit, OMAFRA

Veterinarians and producers have expressed concern regarding the understanding of organic regulations, their impact on the use of small ruminant parasiticides and the loss of animals due to gastrointestinal parasitism.

The Organic Production Systems—General Principles and Management Standards (*CAN/CGSB 32.310-2006,* amended October 2008) states that "medical treatment for sick or injured livestock **shall not be withheld** to preserve their organic status. All appropriate medications sha" be used to restore livestock to health when methods acceptable to organic production fail."

As per Section 6.7.9 of the Standards, when preventive measures fail to control parasites (because of climatic conditions or other uncontrollable factors), **anthelmintics can be used and organic status maintained provided:**

1. Fecal tests or animal examination indicate that an individual or group of animals are infected with parasites;
2. A producer has received written instructions from a veterinarian indicating the product to be used, the individual or group of animals to be treated, the dose and route of administration;
3. Slaughter animals under one year of age are treated only once and slaughter animals over a year of age receive a maximum of two treatments per year. Slaughter animals that require further treatment will lose organic status;
4. Dairy animals needing more than two treatments per year (antibiotics and/or anthelmintics) will lose their organic status and will go through a 12-month transition period to resume organic status. These dairy animals will never be organic for slaughter purposes;
5. A pregnant animal may be treated during gestation (frequency—see points 3 and 4 above);
6. Withdrawal times are twice the label requirement or 14 days, whichever is longer (with the exception of ivermectin products labelled for sheep, all other anthelmintics are considered extra-label drug use. Withdrawal times for sheep and goats are not the same as the labelled cattle withdrawal times, contact CgFARAD for small ruminant recommendations);
7. Producers using anthelmintics not listed in the Permitted Substances Lists create a written action plan (including timing), describing how they will adjust/change their parasite control plan to avoid similar situations in the future.

Producers should always check with their organic certification body for interpretation of the regulations ***prior to treating animals*** to make sure that a product is allowed to be used in their production system. At this time, some certification bodies may follow a more stringent interpretation of the National Organic Standards.

US Equine Piroplasmosis Outbreak

Janet Alsop, Veterinary Science and Policy Unit, OMAFRA

Equine piroplasmosis is caused by infection with the protozoal organisms *Theileria equi* (formerly known as *Babesia equi*) and/or *Babesia caballi*. It is endemic in many tropical and subtropical regions. Because the clinical signs, such as poor appetite, fever, anaemia or weight loss, are non-specific, it may be difficult to diagnose. The disease may be fatal in up to 20 percent of cases. It is spread by several species of ticks, the use of contaminated needles, and possibly through blood-contaminated semen of infected stallions. Animals that survive the acute phase of infection may become long-term carriers.

Piroplasmosis can be diagnosed in blood smears in acutely-affected animals, but, because the organisms can be difficult to detect in carriers, serological tests, including CF, IFA, and ELISA, are often the diagnostic methods of choice. Other methods of diagnosis include DNA probes, in vitro culture, and the inoculation of splenectomised animals with blood from suspected carriers.

There is no vaccine and treatment is generally ineffective. Neither *B. caballi* nor *T. equi* seems to be an important zoonosis.

Piroplasmosis was officially eradicated from the US in 1988 and is considered a foreign animal disease (FAD) in both the US and Canada. Isolated cases were identified in the US in 2008 and June 2009. However, a large number of infected horses have been identified in a recent outbreak. As of December 3, 2009, 334 positive horses were identified in 12 states. The majority of the positive horses (289) are currently living on the index premises in Texas. The remainder previously lived on the index premises. All known positive horses are under quarantine, and contact testing is ongoing. It is probable that infected horses were present on the index farm for at least a year before being identified. The widespread geographical location of infected horses suggests that equine piroplasmosis may be on its way to becoming an endemic disease in the United States.

It is not clear where this outbreak (or the other recent US outbreaks) originated and it is not known how so many horses became infected. Tick investigations are ongoing.

As a result of the current investigation, Canada has imposed restrictions on the importation of horses from Texas. As of December 14, 2009, there were no cases in, or reported links to, Canada.

Equid Blog. www.equidblog.com

proMED-mail. www.promedmail.org

Center for Food Security and Public Health, Iowa State University. www.cfsph.iastate.edu/Factsheets/pdfs/equine_piroplasmosis.pdf

Tumours and Tumour-like Masses in Horses

Bob Wright, Robert G. Wright Veterinary Services, Belwood, Ontario, and Hans Delaunois-Vanderperren, Equine Veterinarian, Norfolk, United Kingdom

Lumps and bumps that occur on a horse's skin can be divided into neoplastic (tumour) and non-neoplastic (inflammatory or parasite-induced) masses. The location of the lump, its outward appearance, the age of the horse and the coat colour often help in the differentiation of the type of mass. Confirmation often requires histological (microscopic) examination.

Part 1 of this series will discuss neoplastic masses. Part 2 will focus on non-neoplastic masses, including inflammatory and parasite-induced masses.

Part 1: Neoplastic Masses

The three common tumours that affect the skin of horses are sarcoids, squamous cell carcinomas and melanomas.

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Sarcoids

The equine sarcoid (**Figure 1**) is a locally aggressive, fibroblastic skin tumour, which can appear as a flat or cauliflower-like growth, occurring singularly or as multiple growths. It is the most common dermatological neoplasia reported in horses. The bovine papillomavirus (BPV), types 1 and 2, are associated with the pathogenesis of sarcoids [1]. Sarcoids usually appear in younger horses and may spontaneously disappear. The distribution of lesions and the epidemiology of sarcoids strongly suggests that flies are significant as vectors [2, 3].

Figure 1. Sarcoid on the belly.

There is no consistently effective therapy and therefore veterinarians use a variety of treatments, including: ligation, surgical excision, cryosurgery, laser surgery, topical application of cytotoxic compounds (e.g., zinc chloride, 5FU cream (called Efudex in Canada)) or intra-lesional injections of cisplatin, immunomodulation (e.g., EqStim, BCG) and autogenous polymerized tumour particles (vaccine made from a sarcoid). Commonly, when one or a few of the sarcoids are removed, the remaining sarcoids disappear.

Squamous Cell Carcinomas

Squamous cell carcinomas (**Figure 2**) can be aggressive tumours that occur around the eye and the penis in adult horses. They are the most common penile and preputial neoplasm in the horse [4]. Smegma, the waxy exudate found around the penis and sheath, is suggested as being the most likely carcinogen [5]. These tumours may metastasize to regional lymph nodes if not treated aggressively. Therefore, any change in skin pigmentation around the eye, penis or sheath should be immediately examined by a veterinarian. Treatment options include surgical excision, cryosurgery or laser surgery. Reoccurrence after treatment can be expected in 17-25% of cases [4].

Figure 2. Squamous cell carcinoma on the penis of a gelding.

Melanomas

For the Percheron breed and horses that are white or dappled in colour, the most common neoplasia is the melanoma or melanocytic tumour (**Figure 3**). Melanoma occurrence in grey horses is common. Melanomas are equine proliferative cutaneous melanocytic lesions and have at least three different forms, including: melanocytic nevi (melanocytoma), dermal melanomata (multiple, confluent dermal melanomas are referred to as dermal melanomatosis) and anaplastic malignant melanomata [1, 6]. These

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tumours commonly appear under the tail, perineum and external genitalia, as well as in the parotid area. They are usually slow-growing, locally invasive tumours with the potential to metastasize internally. Surgical excision, cryosurgery or laser surgery can be used to remove those melanomas that are bothersome to the horse and owner. Cimetidine has been used to slow the growth of melanomas with mixed results.

1. *Schöniger S, Summers BA. Equine skin tumours in 20 horses resembling three variants of human melanocytic naevi. Vet Dermatol 2009; 20(3):165-73. Epub 2009 Apr 3.*
2. *Knottenbelt D. Skin neoplasia: sarcoid. In: 9th Congresso Nazionale Multisala SIVE. Pisa, 2003.*
3. *Yu AA (2006): Sarcoids. Proc American Association of Equine Practitioners 2006; 52:478-483.*
4. *van den Top JG, de Heer N, Klein WR, Ensink JM. Penile and preputial squamous cell carcinoma in the horse: a retrospective study of treatment of 77 affected horses. Equine Vet J 2008; 40(6):533-537.*
5. *Lopate C, LeBlanc M, Knottenbelt D. Neoplasms of the reproductive organs. In: Chapter 4, Equine stud farm medicine and surgery. The Stallion. London:Saunders, Elsevier Science Ltd., 2003:100-104.*
6. *Valentine BA. Equine melanocytic tumours: A retrospective study of 53 horses (1988-1991). J Vet Internal Medicine 1995; 9(5):291-297.*

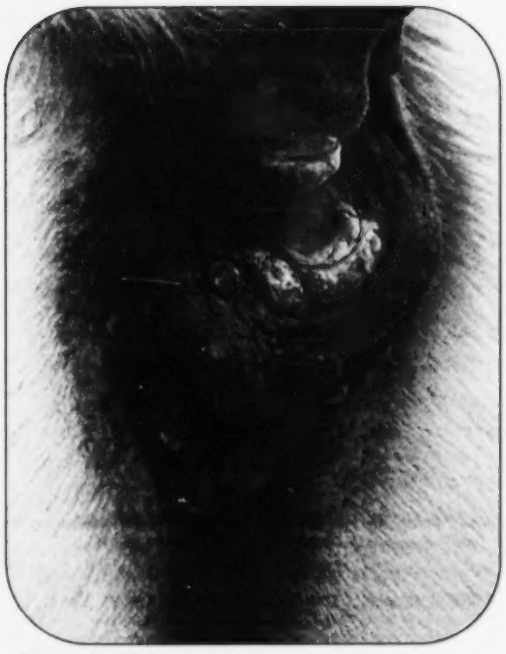

Figure 3. Melanoma of the tail and perineal area of a mare.

Infectious Laryngotracheitis (ILT)

Babak Sanei, Veterinary Science and Policy Unit, OMAFRA

ILT is a contagious viral disease that mainly affects chickens. Despite increased awareness and biosecurity measures, there were cases in five Canadian chicken flocks in 2008 - four in Quebec and one in Ontario. To date, there has not been any laboratory diagnosis of ILT in turkeys in Canada. This disease is a concern because of potentially high bird mortality, disease spread and economic losses. ILT is on the CFIA immediately notifiable disease list. All cases in broiler flocks have to be declared **prior** to shipment to the slaughter plant to ensure ILT does not get into the export market.

ILT outbreaks usually occur in birds older than 28 days of age. In its most severe form, ILT virus can result in elevated mortality, ranging from 10-20%. The disease mainly affects the upper respiratory tract, causing an accumulation of blood and mucus in the trachea. Birds will often extend their necks to ease breathing and cough to expel blood from the lumen. In milder forms of ILT, watery eyes and nasal discharge, with or without swollen sinuses, and low mortality (as low as 1-2%) may be the only signs of infection. (**Figure 1**)

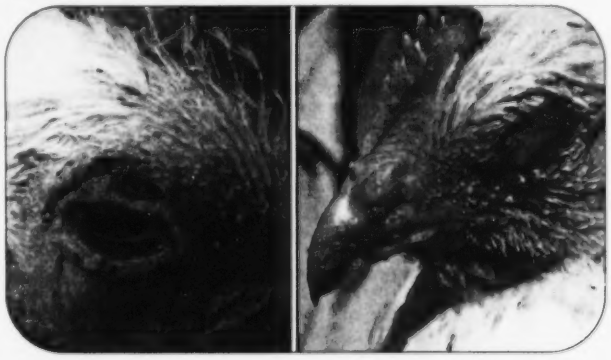

Figure 1. Infectious Laryngotracheitis (ILT) in chickens.
Photos courtesy of Dr. Guillermo Zavala

(Continued on page 17)

ILT virus can be spread through respiratory secretions, contaminated clothing or equipment. The virus can survive in the environment for 22 hours at 37°C, or 30 days at 4-10°C. Ineffective biosecurity measures are responsible for most ILT outbreaks. Improper dead bird disposal, manure handling and live haul transportation can increase the risk of ILT spread. Infected backyard flocks may also be a viral source for neighbouring commercial farms.

During an ILT outbreak, control at the regional level requires a joint effort by all segments of the poultry industry. Additional biosecurity measures should be implemented on infected premises:

- The producer should notify the marketing board and all companies that regularly visit the farm.
- Regular visits by service reps should be postponed.
- Clothing and footwear should be changed **and** hands washed after leaving infected premises.
- Visits to other poultry farms should be avoided if possible; if not, personnel should shower and change clothing and footwear before exposure to non-infected flocks.
- Wild birds or animals should not have access to dead birds. The rendering company should be notified so that the farm is scheduled for the last pickup of the day. Dead birds should be transported to the roadside in a covered container.
- Catchers must follow strict biosecurity measures

After shipping, the barn should be heated to 38°C for 100 hours to kill the ILT virus. A downtime of at least two weeks, after cleaning and disinfecting, is strongly recommended before the next placement.

ILT can be prevented with vaccination. Tissue culture vaccines (TCO), administered intraocularly, have been successfully used in broiler flocks in Ontario. TCO vaccines do not spread from bird to bird and do not cause disease in naïve, unvaccinated birds. Chicken Embryo Origin (CEO) vaccines, also administered intraocularly, provide a higher level of immunity; however, if administered improperly through mass vaccination (e.g., water), they can cause clinical signs in the vaccinated flock. CEO vaccines are commonly used in commercial layer or broiler breeder flocks. Many outbreaks of ILT in broiler flocks are caused by CEO vaccine strains, usually because of inadequate biosecurity measures, so it is best to limit the use of these vaccines.

Available Resources

New resources available from Equine Guelph and the University of Guelph:

- A new online biosecurity tool to help assess the risk of introducing infectious disease and control the spread of infections in horses is now available for use. The Biosecurity Risk Calculator is available on the Equine Guelph website at *www.equineguelph.ca/education/biosecurity.php*

- "EQUIDBLOG" (*www.equidblog.com*), from the University of Guelph's Ontario Veterinary College, offers information relating to horse health, equine viruses, infectious diseases and infection control. The site is co-ordinated by Drs. Scott Weese and Maureen Anderson of Ontario Veterinary College's Department of Pathobiology.

Deadstock Disposal

The Ministry of Agriculture, Food and Rural Affairs and the Ministry of the Environment, in consultation with stakeholders, have developed new regulations for the disposal of deadstock in Ontario. The new regulations came into force on March 27, 2009. For information on deadstock disposal options and the new regulations, refer to *www.omafra.gov.on.ca/english/livestock/deadstock/index.html*

Continuing Education/Coming Events

January 19, 20, & 21, 2010	Herd Management Conference presented by CanWest DHI: January 19, Legion Hall, Chesterville, Ontario; January 20, Memorial Hall, Tavistock, Ontario; January 21, PMD Complex, Drayton, Ontario. *www.canwestdhi.com/pdf_files/2010%20herd%20management%20conference%20flyer.pdf*
January 19-22, 2010	Banff Pork Seminar 2010, Banff, Alberta *www.banffpork.ca*
January 28-30, 2010	Ontario Veterinary Medical Association Annual Conference, Westin Harbour Castle, Toronto, Ontario. *www.ovma.org/upcoming_events/conference.html*
January 31-February 3, 2010	National Mastitis Council's 49th Annual Meeting, Hyatt Regency, Albuquerque, New Mexico. *www.nmconline.org/annualmeet/2010*
February 18-20, 2010	Ontario Association of Veterinary Technicians 32nd Annual Conference. *www.oavt.org*
March 6-9, 2010	American Association of Swine Veterinarians 41st Annual Meeting, Hilton Omaha Hotel, Omaha, Nebraska. *http://aasv.org/annmtg*
March 15-17, 2010	2010 National Institute for Animal Agriculture Annual Meeting, The Westin Crown Center, Kansas City, Missouri. *www.animalagriculture.org/Solutions/Annual%20Meeting/2010/Home.html*
March 31 & April 1, 2010	London Swine Conference 2010, London Convention Centre, London, Ontario. *www.londonswineconference.ca*
May 12 & 13, 2010	46th annual Eastern Nutrition Conference, Delta Hotel, Guelph, Ontario. *www.anac-anac.ca/eventspublications/enc/index.html*
May 29 & 30, 2010	Towards One Health: Multiple Disciplines Working Together for Optimal Health of People, Animals and the Environment, University of Guelph, Guelph, Ontario—presented by the Canadian Association of Veterinary Epidemiology and Preventive Medicine. *www.ovc.uoguelph.ca/cavepm/page/registration.cfm*
June 9-11, 2010	World Pork Expo, Iowa State Fairgrounds, Des Moines, Iowa. *www.worldpork.org*
July 7-10, 2010	62nd CVMA Convention, University of Calgary, Calgary, Alberta. *http://canadianveterinarians.net/professional-convention-highlights.aspx*
July 18-21, 2010	21st International Pig Veterinary Society Congress—Sharing Ideas-Advancing Pig Health, Vancouver Convention and Exhibition Centre, Vancouver, British Columbia. *www.ipvs2010.com*
November 14-18, 2010	26th World Buiatrics Congress, Espacio Riesco Convention Centre, Santiago, Chile. *www2.kenes.com/buiatrics2010/congress/Pages/General_Information.aspx*

Season's Greetings

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Deadline for next issue: February 19, 2010

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